

WHAT IS CLAIMED IS:

- 1 1. For use in a system capable of creating visual summaries
2 of video material, an apparatus for creating a compact visual
3 summary of video material, said apparatus comprising:
4 a visual summary controller capable of receiving keyframes of
5 said video material;
6 wherein said visual summary controller is capable of
7 extracting frame signatures from said keyframes, and capable of
8 using said frame signatures to create superhistograms from said
9 keyframes, and capable of using said frame signatures and said
10 superhistograms to create a compact visual summary of said video
11 material.
- 1 2. The apparatus as claimed in Claim 1 wherein said visual
2 summary controller is capable of filtering said keyframes and
3 extracting frame signatures from said filtered keyframes before
4 using said frame signatures to create said superhistograms to
5 create a compact visual summary of said video material.
- 1 3. The apparatus as claimed in Claim 2 wherein said visual
2 summary controller is capable of creating said compact visual
3 summary of said video material by using said superhistograms to
4 cluster said filtered keyframes, and by adding a representative

5 keyframe from said clustered keyframes to said compact visual
6 summary of said video material.

1 4. The apparatus as claimed in Claim 2 wherein said frame
2 signature is a histogram.

1 5. The apparatus as claimed in Claim 3 wherein the distance
2 measure for clustering is equal to a histogram difference
3 calculated by one of: L1 distance measure method, L2 distance
4 measure method, histogram intersection method, Chi Square test
5 method, and bin-wise histogram intersection method.

1 6. The apparatus as claimed in Claim 3 wherein said visual
2 summary controller is capable of selecting a representative image
3 for each of said superhistograms, wherein said representative image
4 is one of: the first image in each family histogram, the most
5 meaningful image in each superhistogram, a randomly chosen image,
6 and an image that is closest to the cluster center.

1 7. The apparatus as claimed in Claim 5 wherein said visual
2 summary controller is capable of selecting a family histogram to
3 use to create said compact visual summary of said video material.

1 8. The apparatus as claimed in Claim 1 wherein said visual
2 summary controller further comprises:

3 a visual summary retrieval module capable of retrieving a
4 compact visual summary stored in a memory unit and causing said
5 compact visual summary to be displayed in response to a user
6 request.

1 9. The apparatus as claimed in Claim 3 wherein said visual
2 summary controller is capable of using said compact visual summary
3 to access at least one portion of said video material.

1 10. The apparatus as claimed in Claim 3 wherein said visual
2 summary controller is capable of using said compact visual summary
3 to create new video material.

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1 11. A system capable of creating visual summaries of video
2 material, said system comprising an apparatus for creating a
3 compact visual summary of video material, said apparatus
4 comprising:

5 a visual summary controller capable of receiving keyframes of
6 said video material;

7 wherein said visual summary controller is capable of
8 extracting frame signatures from said keyframes, and capable of
9 using said frame signatures to create superhistograms from said
10 keyframes, and capable of using said frame signatures and said
11 superhistograms to create a compact visual summary of said video
12 material.

1 12. The system as claimed in Claim 11 wherein said visual
2 summary controller is capable of filtering said keyframes and
3 extracting frame signatures from said filtered keyframes before
4 using said frame signatures to create said superhistograms to
5 create a compact visual summary of said video material.

1 13. The system as claimed in Claim 12 wherein said visual
2 summary controller is capable of creating said compact visual
3 summary of said video material by using said superhistograms to

4 cluster said filtered keyframes, and by adding a representative
5 keyframe from said clustered keyframes to said compact visual
6 summary of said video material.

1 14. The system as claimed in Claim 12 wherein said frame
2 signature is a histogram.

1 15. The system as claimed in Claim 13 wherein the distance
2 measure for clustering is equal to a histogram difference
3 calculated by one of: L1 distance measure method, L2 distance
4 measure method, histogram intersection method, Chi Square test
5 method, and bin-wise histogram intersection method.

1 16. The system as claimed in Claim 13 wherein said visual
2 summary controller is capable of selecting a representative image
3 for each of said superhistograms, wherein said representative image
4 is one of: the first image in each family histogram, the most
5 meaningful image in each superhistogram, a randomly chosen image,
6 and an image that is closest to the cluster center.

1 17. The system as claimed in Claim 16 wherein said visual
2 summary controller is capable of selecting a family histogram to
3 use to create said compact visual summary of said video material.

1 18. The system as claimed in Claim 11 wherein said visual
2 summary controller further comprises:

3 a visual summary retrieval module capable of retrieving a
4 compact visual summary stored in a memory unit and causing said
5 compact visual summary to be displayed in response to a user
6 request.

1 19. The system as claimed in Claim 13 wherein said visual
2 summary controller is capable of using said compact visual summary
3 to access at least one portion of said video material.

1 20. The system as claimed in Claim 13 wherein said visual
2 summary controller is capable of using said compact visual summary
3 to create new video material.

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1 21. For use in a system capable of creating visual summaries
2 of video material, a method for creating a compact visual summary
3 of video material, said method comprising the steps of:

4 receiving in a visual summary controller keyframes of said
5 video material;

6 extracting frame signatures from said keyframes;

7 using said frame signatures to create superhistograms from
8 said keyframes; and

9 using said frame signatures and said superhistograms to create
10 a compact visual summary of said video material.

1 22. The method as claimed in Claim 21 further comprising the
2 steps of:

3 filtering said keyframes received in said visual summary
4 controller; and

5 extracting frame signatures from said filtered keyframes
6 before using said frame signatures to create said superhistograms
7 to create a compact visual summary of said video material.

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1 23. The method as claimed in Claim 22 further comprising the
2 steps of:

3 using said histograms to cluster said filtered keyframes; and
4 adding a representative keyframe from said clustered keyframes
5 to said compact visual summary of said video material.

1 24. The method as claimed in Claim 23 wherein the distance
2 measure for clustering is equal to a histogram difference
3 calculated by one of: L1 distance measure method, L2 distance
4 measure method, histogram intersection method, Chi Square test
5 method, and bin-wise histogram intersection method.

1 25. The method as claimed in Claim 23 wherein said visual
2 summary controller is capable of selecting a representative image
3 for each of said superhistograms, wherein said representative image
4 is one of: the first image in each family histogram, the most
5 meaningful image in each superhistogram, a randomly chosen image,
6 and an image that is closest to the cluster center.

1 26. The method as claimed in Claim 23 further comprising the
2 step of:
3 selecting a family histogram to use to create said compact
4 visual summary of said video material.

1 27. The method as claimed in Claim 23 further comprising the
2 steps of:
3 retrieving a compact visual summary stored in a memory unit;
4 and
5 causing said compact visual summary to be displayed in
6 response to a user request.

1 28. The method as claimed in Claim 23 further comprising the
2 step of:
3 causing said visual summary controller to use said compact
4 visual summary to access at least one portion of said video
5 material.

1 29. The method as claimed in Claim 23 further comprising the
2 step of:
3 causing said visual summary controller to use said compact
4 visual summary to create new video material.

1 30. For use in a system capable of creating visual summaries
 2 of video material, computer-executable instructions stored on a
 3 computer-readable storage medium for creating a compact visual
 4 summary of video material, the computer-executable instructions
 5 comprising the steps of:

6 receiving in a visual summary controller keyframes of said
 7 video material;

8 extracting frame signatures from said keyframes;

9 using said frame signatures to create superhistograms from
 10 said keyframes; and

11 using said frame signatures and said superhistograms to create
 12 a compact visual summary of said video material.

1 31. The computer-executable instructions stored on a
 2 computer-readable storage medium as claimed in Claim 30 further
 3 comprising the step of:

4 filtering said keyframes received in said visual summary
 5 controller; and

6 extracting frame signatures from said filtered keyframes
 7 before using said frame signatures to create said superhistograms
 8 to create a compact visual summary of said video material.

1 32. The computer-executable instructions stored on a
 2 computer-readable storage medium as claimed in Claim 31 further
 3 comprising the steps of:

4 using said histograms to cluster said filtered keyframes; and
 5 adding a representative keyframe from said clustered keyframes
 6 to said compact visual summary of said video material.

1 33. The computer-executable instructions stored on a
 2 computer-readable storage medium as claimed in Claim 32 wherein the
 3 distance measure for clustering is equal to a histogram difference
 4 calculated by one of: L1 distance measure method, L2 distance
 5 measure method, histogram intersection method, Chi Square test
 6 method, and bin-wise histogram intersection method.

1 34. The computer-executable instructions stored on a
 2 computer-readable storage medium as claimed in Claim 32 wherein
 3 said visual summary controller is capable of selecting a
 4 representative image for each of said superhistograms, wherein said
 5 representative image is one of: the first image in each family
 6 histogram, the most meaningful image in each superhistogram,
 7 a randomly chosen image, and an image that is closest to the
 8 cluster center.

1 35. The computer-executable instructions stored on a
2 computer-readable storage medium as claimed in Claim 34 further
3 comprising the step of:

4 selecting a family histogram to use to create said compact
5 visual summary of said video material.

1 36. The computer-executable instructions stored on a
2 computer-readable storage medium as claimed in Claim 30 further
3 comprising the steps of:

4 retrieving a compact visual summary stored in a memory unit;

5 and

6 causing said compact visual summary to be displayed in
7 response to a user request.

1 37. The computer-executable instructions stored on a
2 computer-readable storage medium as claimed in Claim 32 further
3 comprising the step of:

4 causing said visual summary controller to use said compact
5 visual summary to access at least one portion of said video
6 material.

1 38. The computer-executable instructions stored on a
2 computer-readable storage medium as claimed in Claim 32 further
3 comprising the step of:

4 causing said visual summary controller to use said compact
5 visual summary to create new video material.

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